



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,247	04/11/2001	Michael R. Bruce	AMDA.486PA	3719

7590 04/04/2005
Crawford PLLC
Suite 390
1270 Northland Drive
St. Paul, MN 55120

EXAMINER

HESELTIME, RYAN J

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Advisory Action
Before the Filing of an Appeal Brief**

Application No.

09/833,247

Applicant(s)

BRUCE ET AL.

Examiner

Ryan J Hesseltine

Art Unit

2623

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 14 March 2005 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☐ The period for reply expires _____ months from the mailing date of the final rejection.
b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The reply was filed after the date of filing a Notice of Appeal, but prior to the date of filing an appeal brief. The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
(b) ☐ They raise the issue of new matter (see NOTE below);
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
The status of the claim(s) is (or will be) as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: _____.
Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
See Continuation Sheet.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☐ Other: _____.

JINGGE WU
PRIMARY EXAMINER

Continuation of 11. does NOT place the application in condition for allowance because: Applicant's arguments filed March 14, 2005 have been fully considered but they are not persuasive.

On page 5, third paragraph, applicant states, "The Office Action asserts that the '735 reference [Zimmermann] teaches recording a plurality of images of the selected portion as substrate is being removed therefrom, as claimed, at col. 5, lines 15-46. However, the cited portion does not appear to teach any recording of images." The examiner respectfully disagrees. Zimmermann discloses the use of a scanning electron microscope 18 or other observation device to observe samples and their failure modes, or to observe etching processes to chart progress, etc. (column 5, line 15-18). While it is not explicitly disclosed that a plurality of images are recorded, it is implicit if not inherent that the observed images are recorded or stored in some format. Zimmermann discloses that the observation device can be used to observe etching processes to chart progress, which implies that images are taken to record the progress of the etching. In addition, Phaneuf et al. (USPN 6,288,393) explicitly discloses that in a conventional method, a composite image is stored for further analysis (column 5, line 6-22). Even if it can be shown that Zimmermann does not disclose recording a plurality of images, it would have been obvious to one of ordinary skill in the art at the time the invention was made to do so.

On page 5, fourth paragraph, applicant states, "With particular respect to the Section 103(a) rejection of claims 12 and 13, Applicant respectfully traverses the Official Notice taken at page 5 because it is unclear that the skilled artisan would edit a three-dimensional image since a three-dimensional image would not be formed." The examiner respectfully disagrees. It has been shown with respect to claim 1, from which claims 12 and 13 depend, that Phaneuf discloses creating a three-dimensional image of the selected portion of the die with a plurality of images and analyzing the die therefrom (see Final Office Action at paragraph 7).

On page 5, last paragraph, applicant states, "Applicant further traverses the Section 103(a) rejection because the '735 reference [Zimmermann] teaches away from the proposed combination with the '393 reference [Phaneuf]. The Office action proposes modifying the '735 in-situ defect analysis method to include the automated imaging method taught by the '393 reference ... The '393 reference is not directed to failure analysis but instead to automatic reverse engineering of semiconductor chips in an ex-situ system that disregards the integrity of the chip once the process is complete." The examiner respectfully disagrees. First of all, the cited sections in Phaneuf (abstract and Fig. 4), do not explicitly state that the method is ex-situ. For example, Figure 4 shows that the integrated circuit (IC) is inserted into the focused ion beam (FIB) imaging device, scanned to produce an image of a portion of the exposed layer, and the precision stage is moved. Neither Figure 4 nor the abstract states that the IC is removed from the FIB imaging device while it is being imaged. Phaneuf later discloses that the FIB imaging apparatus is used to etch away material from the exposed IC layer in a selective fashion, which allows imaging of subsequent layers without requiring the removal and replacement of the IC (column 7, line 18-25). In addition, Zimmermann and Phaneuf both disclose the use of a scanning electron microscope (SEM), so it is suggested that a plurality of images are taken using the SEM and made into the three-dimensional image using the technique disclosed by Phaneuf, which image is subsequently analyzed for failures in accordance with Zimmerman's invention. With regard to applicant's suggestion that the rejection fails due to lack of evidence of motivation, the examiner would like to point applicant's attention to paragraph 7 of the Final Office Action which includes a statement of the examiner's motivation to combine the two references. The examiner would also like to point out that creating such a three-dimensional image of the semiconductor chip would also enhance Zimmerman's failure analysis as well as the reasons pointed out in Phaneuf.

On page 6, first paragraph, applicant states, "Moreover, the proposed modification of the '735 reference [Zimmermann] is improper because it would frustrate the purpose and operation of the '735 reference ... The '735 reference is directed to a site-specific method of finding pinholes in dielectrics by

observing an etch process in order to identify the pinhole ... The '393 [Phaneuf] etching method, however, is an automated method that etches and subsequently images layers as they are removed ... Inclusion of this automated etching/imaging method would replace the '735 method's observation aspect of the etch process and would undermine the purpose of the observation by etching through any potential pinholes." The examiner respectfully disagrees. The examiner would first like to point out that etching through pinholes is apparently not a problem in the Zimmermann reference since it is disclosed that, in a preferred embodiment, a selective etchant is employed to etch silicon (Si) through pinholes in dielectric layers (column 4, line 38-44). In response to applicant's argument that the proposed modification of Zimmermann is improper because it would frustrate its purpose and operation, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). The examiner was not necessarily suggesting that Zimmerman's etching method be modified in view of Phaneuf. The proposed combination only relies upon Phaneuf's three-dimensional imaging method to satisfy the claimed limitations.